REGIONAL COMPLICATIONS, VASCULAR THROMBOSIS AND PREVENTION OF HEMORRHAGE ASSOCIATED WITH INTRA-ARTICULAR TRANEXAMIC ACID IN TOTAL KNEE ARTHROPLASTY: A COHORT STUDY.

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Background and Goal of Study:

Patients undergoing total knee arthroplasty (TKA) are at risk of significant perioperative blood loss. Surgical site infection (SSI, including prosthetic joint infection) is one of the causes of TKA failure, and it is associated with significant morbidity. Intravenous tranexamic acid (TXA) has been recommended to decrease associated blood loss^{1,2}, and it has not been shown to increase adverse events such as venous thromboembolic disease (VTD)^{3,4}. Intra-articular TXA (IA-TXA) is also recommended^{1,3}, but there are not enough studies about regional associated complications (surgical site infections-SSI-, aseptic mobilization-AM-, or periprosthetic fracture-PF-)³⁻⁵. Our hypothesis is that IA-TXA is a useful preventive treatment to reduce hemorrhage associated with TKA without increasing the risk of thrombotic or regional complications.

Figure A: L-Lysine

Figure B: Tranexamic acid

Materials and Methods:

With the authorization of our institutional investigation committee, an observational retrospective cohort was performed to study the effect of 2 different preventive blood loss programs. Not exposed group (group A) and exposed group (group B), differed only at exposition at 3 grams of IA-TXA, developed during different years. Groups were operated by the same team with large TKA experience and with the same prosthetic model. Perioperative hemorrhage (hemoglobin loss > 2 g/dl, and transfusion rates), VTD and arterial thrombosis (stroke, ischemic cardiopathy...) until 1st postoperative year, and regional complications till 3rd postoperative year were analyzed.

Conclusions:

IA-TXA reduces hemorrhage and transfusion associated with TKA, and it does not seem to increase the risk of associated regional complications neither vascular thrombotic events. More studies about regional IA-TXA associated complications are needed.

Errata:

***The correct incidence of surgical site infection at group B was 4%** (5% was a writing error at submission time).

****The correct incidence of periprosthetic fracture at group A was 2%** (3% was a writing error at submission time).

References:

1.- Hamlin BR, DiGioia AM, Plakseychuk AY, et al. Topical versus intravenous tranexamic acid in total knee arthroplasty. J Arthroplasty. 2015;30(3):384-6.
2.- Digas G, Koutsogiannis V, Meletiadis G, et al. Intra-articular injection of tranexamic acid reduce blood loss in cemented total knee arthroplasty. European Journal of Orthopaedic surgery & Traumatology. 2015;25(7): 1181-8.
3.- Zhang Y, Fu X, Liu WX, et al. Safety and efficacy of intra-articular injection of tranexamic acid in total knee arthroplasty. Orthopedics. 2014;37(9):e775-82.
4.- Alshryda S, Sukeik M, Sarda P, et al. A systematic review and meta-analysis of the topical administration of tranexamic acid in total hip and knee replacement. Bone Joint J. 2014;96-B(8):1005-15.
5.- Pedersen AB, Mehnert F, Sorensen HT, et al. The risk of venous thromboembolism, myocardial infarction, stroke, major bleeding and death in patients undergoing total hip and knee replacement: a 15-year retrospective cohort study of routine clinical practice. Bone Joint J. 2014;96-B(4):479-85.

Figure C: XR Knee osteoarthritis.

Figure D: XR with TKA.

Results and Discussion:

A total of 200 patients were analyzed, 100 randomized outpatients per group. ASA III and IV were more frequent at group B (RR 1,3; p=0,032), so this group had more basal preoperative risk of general complications. Basal hemoglobin was similar (13,8 g/dl at group A Vs 13,9 at group B). Hemoglobin loss > 2 g/dl was more frequent at group A (RR 0,81; p< 0,001), as transfusional rates (RR 0,12; p< 0,001). VTD and arterial thrombosis were similar (0% & 2% respectively at group A Vs 1% & 1% at group B). Regional complications were similar (7% SSI at group A Vs **4%*** at group B; 1% AM at group A Vs 3% at group B; **2%**** PF at group A Vs 0% at group B).

Table 1. Patient data and significant behaviour groups. Group A: Not exposed IA-TXA group; Group B: Exposed IA-TXA group.

	Group A (n=100)	Group B (n=100)	P-value
ASA III+IV cases	49	64	0,032
Surgical site infection cases (SSI)	7	4	0,355
Aseptic Mobilization cases (AM)	1	3	0,312
Periprosthetic Fracture cases (PF)	2	0	0,733
Venous Thromboembolic Disease cases (VTD)	0	1	0,316
Arterial thrombosis cases	2	1	0,563
Medium Basal Hb (g/dl)	13,8	13,9	0,476
Hb loss>2 g/dl cases	98	80	0,000
Transfusional rate (medium red packed blood cells/patient)	0,32	0,06	0,005
Venous Thromboembolic Disease cases (VTD)	0	1	0,316

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